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Memorandum

TO: Regional Bicycle Working Group

DATE: February, 2008

FR: Garlynn Woodsong

W. I. 1122

CC: Sean Co, Kearey Smith, Lisa Klein, Doug Kimsey

RE: San Francisco Bay Area Regional Bicycle Plan Update for 2009 RTP

This update to the Regional Bicycle Plan and its Bikeway Network represents a major effort to re-catalog every link in the Geographic Information Systems (GIS) databases that electronically describe the extent and cost of the bikeways associated with the plan. Since this update was built off the original 2001 Regional Bicycle Plan, it would be logical to attempt to compare the two plans, especially with regards to cost totals and mileage numbers. However, it is important to note that the methodology has changed considerably, and as a result, the numbers are not directly comparable. This update to the plan should therefore stand on its own, as a more accurate plan that better portrays the existing state of the regional bicycle plan's Regional Bikeway Nnetwork, and the cost to complete all of the unbuilt links in that network.

The 2001 plan stated "only 35 percent of the facilities proposed for the region already exist. Therefore, 65 percent of the proposed bicycle infrastructure is not built." Since the 2001 version of Appendix A for the Regional Bikeway Network did not report built segments of the Network, it's unclear how accurate these numbers are (they were tracked in the GIS, but GIS features were not linked to specific projects in Appendix A). We know that 47% of the 2009 network (as mapped in January, 2008) has been built. What is unclear is how much of this represents changes made to *what* is considered a part of the Regional Network, and how much of this represents *new facility* links that have been constructed since the last update was made to the Regional Bicycle Plan.

Regardless, it is clear that new bicycle facilities have been constructed in the Bay Area since the original 2001 Regional Bicycle Plan (523 then vs. 989 miles of existing bikeways now), and that therefore the situation on the ground may be slowly improving for bicyclists seeking to travel on regional bikeways.

More information can be found in the appendix to this memo.

Appendix

GIS Mapping Process

This update to the Bikeway Network component of the Regional Bicycle Plan was an extremely data-intensive effort. GIS tools were used to construct a new geodatabase, and to map each project in the plan using the 2007 Tele Atlas North America (TANA) street basemap. The 2001 Bike Plan GIS features were remapped using the updates base map, and added to the existing 511 BikeMapper network, which contains all known existing bikeways in the region. Beginning and endpoints were manually entered for each project; distances were calculated by the GIS; and costs were calculated using the process described below.

Previously, there was one GIS dataset describing the Regional Bikeway Network, and a different dataset that describes the Bay Trail alignment (which is maintained by Bay Trail project staff at ABAG). A thorough analysis of these two datasets revealed widespread overlap, which highlighted the need to integrate the Bay Trail network with the master Regional Bikeway Network. This would eliminate double counting of any link in the network due to feature overlap. Because of the overlap between the Bay Trail and other projects within each county, the Bay Trail is no longer called out separately for funding or mileage totals, although, by definition, all Bay Trail spine segments are part of the Network.

In order to map each project as accurately as possible, the GIS mapping process incorporated the most recent street basemap available from TANA, high-resolution digital aerial photography, information about project locations and regional bicycling infrastructure, as well as outreach efforts to local agencies. While real-world conditions will never be represented with 100% accuracy by a GIS database, MTC GIS staff is confident that this update to the Regional Bikeway Network is a vast improvement over the previous version.

Cost Estimation

Cost for bicycle projects came from three sources:

1. For projects already in Appendix A (from the original Plan), costs were simply escalated to 2006 dollars.
2. For projects not already in Appendix A, counties were asked to provide new project-level cost estimates.
3. For projects where they were not available, costs were estimated based on formulas used in Alameda County's bicycle plan:

Class I: Construct Multi-Use bikeway: \$600,000/mile

Class II: Bike Lanes; Remove lane and add bicycle lane treatment: \$90,000/mile

Class III: Widen Shoulder: \$216,000/mile

Source: 2006 Alameda County Congestion Management Agency Countywide Bicycle Plan Table 5-2, p. 73. The costs for the facility types included a range, and the higher cost estimate per facility was used, based on MTC's analysis of actual project costs from the Alameda Bicycle Network.

Bay Trail

In previous versions of the MTC Regional Bicycle Plan, the Bay Trail was called out specifically with regards to summations of mileage and project costs. In the current plan, however, the Bay Trail is not

totaled separately from the rest of the Regional Bikeway Network. The reason is twofold. Previously, we believe that attempts to pull out separate numbers for Bay Trail costs and mileage have led to double-counting of at least some projects (those that appeared both in the Bay Trail plan and in countywide bicycle plans). We have fixed this by bringing the entire regional portion of the Bay Trail (all “spine” link as well as “connectors” of regional importance) into the GIS files describing the Regional Bikeway Network. In doing so, however, we have discovered that many portions of the Bay Trail overlap with *portions* of specific projects in the county plans, but not with the entire project. (In other cases, there is overlap between the Bay Trail and entire projects, as well.) Out of a desire to not unnecessarily split projects into multiple sub-projects, we have chosen to list those projects that are wholly Bay Trail as such in the Appendix, but not provide a separate summary of the costs or mileage represented by Bay Trail projects in the plan. For a full list of the cost to implement the Bay Trail, please refer to the Bay Trail Project’s *Gap Analysis*, published in 2005.

Mileage Differences

The 2001 Regional Bicycle Network (MTC staff conducted an update to the Regional Bicycle Network in 2004) differs significantly from the current version of the plan with regards to mileage and cost. It is clear that there has been growth in the RBP between the previous and the current version, though the exact amount is unclear. There were 1,894 total miles reported in the 2001 plan, vs. 2,101 in the current version. This growth comes in three categories:

1. Projects that were listed in Appendix A, but not listed on the map
2. Projects that were listed on the map, but not listed in Appendix A.
3. Gaps in the network that were filled in the current plan

In the new plan, every project listed on the map corresponds exactly to a project listed in Appendix A – including Bay Trail projects. This full accounting of the regional network is bound to have added mileage to the totals, by not overlooking any project. Additionally, some gaps have been filled, adding connections to communities representing population clusters of 5,000 or more people, or adding inter-regional connections that had not been previously detailed in the plan.

Table 1: Regional Bikeway Network				2001 RBP			Change, 2001 to 2008				
County	Built	Unbuilt	2009 Total	Proposed	Existing	Bay Trail	2001 Total	Built	Unbuilt	Total	
Alameda	151	159	311	225	88	105	418	64	-66	-107	
Contra Costa	181	137	318	113	139	69	321	43	24	-2	
Marin	37	81	118	54	10	53	117	27	27	1	
Napa	39	61	99	52	28	17	96	11	9	3	
San Francisco	58	47	106	36	45	10	92	13	11	14	
San Mateo	141	104	245	111	33	60	205	108	-7	40	
Santa Clara	241	182	423	90	94	55	239	147	92	185	
Solano	71	109	180	95	41	28	163	30	15	17	
Sonoma	59	214	273	149	29	41	219	30	65	54	
Toll Bridges	13	16	28	18	7	0	25	6	-2	4	
TOTAL	991	1,111	2,101	933	523	437	1,894	467	178	208	
Percentage	47.14%	52.86%		49%	28%	23%					

Similarly, full accounting for all of the projects in the Regional Bicycle Plan has also added to the cost to complete all of these projects. Add to this the cost of inflation, and the cost to fill gaps that existed in the previous version of the network, and you come up with the \$250 million difference between the previous and the current cost to build out the RBP network.

Table 2: Cost to complete Regional Bikeway System

County	Unbuilt mileage	Total cost	2001 Cost	Difference
Alameda	159	\$144,198,485	\$152,744,888	-\$8,546,403
Contra Costa	137	\$24,707,196	\$24,366,700	\$340,496
Marin	81	\$48,031,671	\$27,080,000	\$20,951,671
Napa	61	\$17,358,776	\$13,001,720	\$4,357,056
San Francisco	47	\$23,176,529	\$16,724,940	\$6,451,589
San Mateo	104	\$32,625,315	\$42,438,975	-\$9,813,660
Santa Clara	182	\$195,514,375	\$90,000,000	\$105,514,375
Solano	109	\$38,714,899	\$24,790,000	\$13,924,899
Sonoma	214	\$63,628,081	\$21,477,910	\$42,150,171
Toll Bridges	16	\$380,964,735	\$242,400,000	\$138,564,735
Bay Trail*	-	-	\$59,200,000	-
TOTAL	1,111	\$968,920,062	\$714,225,133	\$254,694,929

* Mileage and cost are included in each county's totals in the current plan, but were called out separately in 2001/2004.

Relationship to BikeMapper

The dataset used as a backbone for the 511 BikeMapper service was used throughout the mapping process to create a new Regional Bike Plan Bikeway Network GIS dataset. Specifically, when no other data was available, the BikeMapper dataset was used to determine if a particular facility should be classified as built or unbuilt. The BikeMapper Network is developed based upon direct feedback from individual county and city jurisdictions, therefore it is viewed as a primary data source describing bike facilities for the nine-county Bay Area region.

While the Regional Bicycle Plan update may cause funding to flow to local jurisdictions to build bicycle facilities, which in turn will be mapped by BikeMapper after they are constructed, there is no direct link back to BikeMapper from the GIS data describing the Regional Bicycle Plan Bikeway Network.